ATMOSPHERIC RADIOACTIVE ISOTOPE MONITORING

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Abstract. The territory of Bishkek city is constantly exposed to pollution by radionuclides caused by stratospheric, tropospheric, and local atmospheric fallouts. The atmospheric mechanism of contamination transfer for different seasons of the year has been presented.

Radon makes the main contribution to the natural radioactivity of atmospheric air and the level of irradiation of the environment and humans through natural sources of radiation. Natural radon, formed in radioactive ores, constantly enters to the hydrosphere and atmosphere. The average volumetric content of radon in the atmosphere is 6·10-18% [1]. Radon is found in many materials, where it can partially diffuse into the environment. The highest content of ^{222}Rn and ^{220}Th is observed in the grounp layer of the atmosphere.

The content of radon in natural waters of Chui region varies widely. About 3.7 Bq/l of radon contains in ordinary drinking and river waters, in lake water - 1.11 Bq / l. A. The concentration of 0.37 Bq / l is typical for lakes and rivers, a concentration of 3.7-370 Bq / l for subterranean waters. Higher concentrations of radon are observed in the waters of some mineral resorts. Concentration of about 37 Bq / l is often determined in tap water from artesian wells. If we consider that a person consumes 0.3 liters of water per day containing 37 Bq / l of 222Rn, then the estimated absorbed dose for the stomach is approximately 0.02 mGy / year, and the dose for irradiating the whole body is 100 times less. The concentration of Rn in the premises of Bishkek is 4-6 times higher than in atmospheric air. The main part of Rn is accumulated from building materials and burning coals (about 15 TBq / year). The concentration of Rn increases sharply on the periphery of the city in the heating season, where are located arrays of private houses. The average concentration of Rn for all isolated premises is 0.32 Bq / l, in the USA according to the standard is 0.15 Bq / l.

1. Darby S., Hill D., Doll R. “Radon: A likely carcinogen at all exposures.” Annals of Oncology 12, 2001